REMARKS

Claims 10 and 24-25 are pending in this application. Claims 20 and 21 are cancelled without prejudice to or disclaimer of the underlying subject matter. Claims 1-9 and 11-23 were previously cancelled without prejudice to or disclaimer of the underlying subject matter. No amendments to the claims are presented in this response.

I. Status of Prosecution

The Examiner indicates that "[t]o conform with current office policy, the rejection under 35 USC 112/first paragraph with regard to written description is being reinstated for the pending claims." Office Action at page 2.[1]

The Examiner also indicates that the "rejection of claims 10, 24, and 25 under 35 USC 102(b) as being anticipated by Sigma catalogue is withdrawn." *Id.* Applicants acknowledge and thank the Examiner for the withdrawal of the 35 U.S.C.§ 102(b) with regard to the Sigma catalogue.

II. Claim Rejections – 35 U.S.C. § 101

Claims 10 and 24-25 stand rejected under 35 U.S.C. § 101 "because the claimed invention is not supported by either a specific or substantial asserted utility or a well established utility." Office Action at page 2. Applicants respectfully traverse this rejection for at least the following reasons.

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[1] Applicants note that "Office Policy" does not have the force and effect of law. *Cf. In re Portola Pkg., Inc.*, 120 F.3d 786, 788, 42 U.S.P.Q.2d 1295, 1297 (Fed. Cir. 1997).

The Examiner acknowledges that the specification asserts that "SEQ ID NO: 7 encodes a maize or soybean copalyl diphosphate synthase enzyme (and would presumably be used in the gibberellin pathway to obtain gibberellin), or a fragment thereof." Office Action at page 3. The Examiner also acknowledges that it is known that "CPS catalyzes the first committed step in diterpenoid biosynthesis leading to gibberellins in plants" and that CPS "cyclizes gerenylgerenyl diphosphate (GGD) to copalyl diphosphate (CP)." *Id.* The specification discloses that an amino acid sequence encoded by SEQ ID NO: 7 is 95% identical to a known copalyl diphosphate synthase (CPS) with a Probability Score, or P-Value, of 1e-87 using BLASTN. The specification describes multiple utilities for the present invention based the sequence's ability to encode a copalyl diphosphate synthase enzyme or fragment thereof, including isolating genes involved in the gibberellin pathway, acquiring molecular markers linked to CPS, CPS promoters, CPS cis-regulatory elements, identifying polymorphisms associated with the gibberellin pathway, and as probes for assisting in the isolation of full-length CPS cDNAs or genes, CPS gene mapping, isolation of homologous sequences, and the detection of CPS gene expression. *See, e.g.*, specification at page 57, line 3 *et seq*, under the heading "Uses of the Agents of the Invention." Any of these utilities described alone is enough to satisfy 35 U.S.C. § 101. The Examiner argues, however, that these utilities are not specific or substantial. Office Action at page 4. The Examiner bases this rejection on two basic premises. First, the Examiner alleges "the disclosed uses are generally applicable to broad classes of this subject matter." *Id.* Second, the Examiner asserts that "further characterization of the claimed subject matter would be required to reasonably confirm a 'real world' use." *Id.* Applicants respectfully disagree.

The claimed nucleic acid molecules have been asserted to encode a copalyl diphosphate synthase or fragment thereof. The specification provides ample correlation between the claimed nucleic acid molecule and copalyl diphosphate synthase proteins. Accordingly, the assertion of the use of the claimed nucleic acid molecules to encode a copalyl diphosphate synthase or fragment thereof and corresponding uses associated with encoding CPS satisfies the utility requirement of 35 U.S.C. § 101.

The "threshold for utility is not high: An invention is 'useful' under section 101 if it is capable of providing some identifiable benefit." *Juicy Whip, Inc. v. Orange Bang, Inc.*, 185 F.3d 1364, 1366, 51 U.S.P.Q.2d 1700, 1702 (Fed. Cir. 1999), *citing Brenner v. Manson*, 383 U.S. 519, 534 (1966). Furthermore, an invention need only provide one identifiable benefit to satisfy 35 U.S.C. § 101. *See Raytheon Co. v. Roper Corp.*, 724 F.2d 951, 958, 220 U.S.P.Q. 592, 598 (Fed. Cir. 1983) ("when a properly claimed invention meets at least one stated objective, utility under section 101 is clearly shown").

The Federal Circuit has recently reiterated that the "basic *quid pro quo* contemplated by the Constitution and the Congress for granting a patent monopoly is the benefit derived from the public from an invention with *substantial utility*." *In re Fisher*, 421 F.3d 1365, -- U.S.P.Q.2d -- (Fed. Cir. 2005)(citing *Brenner*, 383 U.S. at 534-35)(emphasis in original). The Court noted that since "*Brenner* our predecessor court, the Court of Customs and Patent Appeals, and this court have required a claimed invention to have a specific and substantial utility to satisfy § 101." *Id.*

Although the Supreme Court has not defined the meaning of the terms "specific" and "substantial", the Federal Circuit discerned the kind of disclosure an application could contain to establish a specific and substantial utility. *Id.* First, the Court indicated that to provide a sub.

stantial utility, the specification should disclose a utility such that "one skilled in the art can use a claimed discovery in a manner which provides some *immediate benefit to the public.*" *Id.* (emphasis original). Second, a specific utility can be disclosed by discussing "a use which is not so vague as to be meaningless," that is that the claimed invention "can be used to provide a well-defined and particular benefit to the public." *Id.*

The Examiner acknowledges that the specification asserts that the claimed nucleic acid sequence "encodes a maize or soybean copalyl diphosphate synthase enzyme or fragment thereof." Office Action at page 4. The Examiner further acknowledges that the utilities are "based upon homology/identity to experimentally known sequences of the cDNA for a maize kaurene synthase A, also known as copalyl diphosphate synthase. *Id.* However, the Examiner asserts that "[i]t is known for nucleic acids as well as proteins, for example, that even a single nucleotide or amino acid change or mutation can destroy the function of the biomolecule in many instances, albeit not in all cases." *Id.*, at page 4. The Examiner also asserts that the claimed sequence is not disclosed as a full-length open reading frame and "it is unpredictable if SEQ ID NO: 7 will successfully encode a functional enzyme." *Id.*, at page 5. The Examiner additionally asserts that further research would be required to confirm a 'real world' use. *Id.*, at page 5.

One of the utilities disclosed in the specification is use of the claimed nucleic acid molecules to encode a copalyl diphosphate synthase or fragment thereof. Specification at page 16, lines 10-17, page 45, line 14 through page 46, line 14 and Table A. The Examiner has previously acknowledged that "applicant(s) have listed this sequence which is known in the prior art and which has a high percentage similarity (95%, table A) to a claimed sequence, SEQ ID NO: 7." Office Action mailed May 5, 2004 at page 4. The Examiner argues however that this utility

is not specific or substantial, apparently because "the citation of sequence similarity results in an unpredictable and therefore unreliable correspondence between the claimed nucleotide and the indicated similar nucleotides of known function and therefore lacks support regarding utility and/or enablement." Office Action at page 5. More specifically, the Examiner argues that "[I]t is known for nucleic acids as well as proteins, for example, that even a single nucleotide or amino acid change or mutation can destroy the function of the biomolecule in many instances, albeit not in all cases." *Id.* While the Examiner proceeds to analyze SEQ ID NO: 7 by citing several publications generally describing the unpredictability of the relationship between sequence and function in some proteins, the Examiner provides no support to show that SEQ ID NO: 7 does not encode CPS as described by the specification. Such a utility is not vague or unknown. In fact, the Examiner has cited to references acknowledging the important roles of CPS in gibberellin biosynthesis. The asserted utility, to encode CPS or fragment thereof is a well-defined use that not any nucleic acid sequence can perform.

The Examiner also argues that there is "reason to doubt whether SEQ ID NO: 7 itself or whether the full cDNA (if one exists) that comprises SEQ ID NO: 7 will successfully encode a functional enzyme." Office Action at page 5. The Examiner refers to several publications suggesting that one plant species may contain CPS pseudogenes, and that certain N-terminal deletions in other CPS genes may destroy gene activity. *Id.* However, the Examiner further argues that "[g]iven the state of the post filing date art, it is reasonable to assume that more than one CPS exists in maize." *Id.* at page 7. Such an argument supports Applicants' assertion that SEQ ID NO: 7 encodes a CPS as SEQ ID NO: 7 is asserted to encode an amino acid sequence with a high degree a similarity to known CPS enzymes. Furthermore, the Examiner has provided no

support that SEQ ID NO: 7 does not encode a functional copalyl diphosphate synthase enzyme or fragment thereof and attempts to shift the burden to the Appellant.

The Examiner further argues that "[w]hile the specification asserts that the nucleic acids of the specification encode a gibberellin pathway enzyme or 'fragment' thereof', it is unclear what use the 'fragment' that SEQ ID NO: 7 appears to be." Final Action at page 6. Assuming, *arguendo*, that SEQ ID NO: 7 encodes a fragment of CPS, the specification still provides utilities for the claimed sequences. For example, the specification provides that the sequences of the invention can be used for modifying gene expression in plants by sense or antisense suppression of the endogenous gene. *See, e.g.*, specification at page 103, line 12 through page 105, line 22. The specification discloses that the nucleic acid sequences can be introduced into a plant cell and transcribed using an appropriate promoter with such transcription resulting in the reduction or suppression of the endogenous CPS. *Id.* Such a reduction or suppression of CPS in a plant does not require the entire CPS coding sequence. *See, e.g.* Specification at page 105, lines 11-15. Moreover, a nucleic acid sequence encoding a fragment of CPS is capable of detecting CPS in a sample. The specification discloses that the nucleic acid sequences can be used to detect CPS, for example in a sample obtained from plant cells or tissues. *See,* specification at page 42, line 20 through page 4, page 73, line 12 through page 80, line 7. As such, the specification asserts specific and substantial utilities for the claimed sequence that encodes a gibberellin pathway enzyme or fragment thereof.

The Examiner argues however that sequence similarity does not reliably predict a protein's function in some cases. Office Action at page 4. However, the Examiner admits that this is not true in all cases. *Id.* As discussed above, the specification provides extensive evi-

dence based on sequence identity that the claimed nucleic acid molecules encode a polypeptide having 95% identity to a known copalyl diphosphate synthase. *See, e.g.,* specification at page 210 (Table A). The specification also indicates by way of the description of the enzymatic function of copalyl diphosphate synthase that the specified enzyme has well-known enzymatic function in the art. *See, e.g.,* specification at page 3, lines 1-5. Further the specification provides a detailed description of the characterization of the specified enzyme and its role in the gibberellin biosynthetic pathway. *See, e.g.,* specification at pages 2-5.

An examiner must accept a utility by an applicant unless the Office has evidence or sound scientific reasoning to rebut the assertion. *See In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992). "More specifically, when a patent application claiming a nucleic acid asserts a specific, substantial, and credible utility, and bases the assertion upon homology to existing nucleic acids or proteins having an accepted utility, the asserted utility must be accepted by the examiner unless the Office has sufficient evidence or sound scientific reasoning to rebut such as assertion." Federal Register 66(4):1096, Utility Guidelines (2001). "[A] 'rigorous correlation' need not be shown in order to establish practical utility; 'reasonable correlation' is sufficient." *Fujikawa v. Wattanasin*, 93 F.3d 1559, 1565, 39 U.S.P.Q.2d 1895, 1900 (Fed. Cir. 1996).

The claimed nucleic acid molecules have been asserted to encode a copalyl diphosphate synthase or fragment thereof. The specification provides ample correlation between the claimed nucleic acid molecule and copalyl diphosphate synthase proteins. Accordingly, the assertion of the use of the claimed nucleic acid molecules to encode a copalyl diphosphate synthase or fragment thereof satisfies the utility requirement of 35 U.S.C. § 101.

In addition to encoding a copalyl diphosphate synthase, the specification describes multiple other utilities for the present invention that are independent of the sequence's ability to encode a copalyl diphosphate synthase enzyme or fragment thereof, including isolating a CPS genes, acquiring molecular markers linked to CPS, CPS promoters, CPS cis-regulatory elements, identifying polymorphisms of CPS, and as probes for assisting in the isolation of full-length CPS cDNAs or genes, CPS gene mapping, isolation of homologous CPS sequences, and the detection of CPS gene expression. *See, e.g.*, specification at page 57, line 3 *et seq*, under the heading "Uses of the Agents of the Invention." Any of these utilities described alone is enough to satisfy 35 U.S.C. § 101. Because Applicant need only establish a single utility to satisfy 35 U.S.C. § 101, and because he has done so in the present case, the premise of the rejection under Section 101 is incorrect, and the rejection should be withdrawn. The Examiner denigrates these utilities however, because "further research is required for such uses." Office Action at page 11.

Many of the disclosed utilities in this case, including these utilities, are directly analogous to the utilities of a microscope, *i.e.*, the claimed nucleic acid molecules may be used to locate and measure nucleic acid molecules encoding CPS within a sample, cell, or organism. The Examiner denigrates this utility by alleging that these uses are not "useful" because the "microscope provides information to the scientist that is automatically useful." Office Action, page 11. However, the fact that, for example, a new and nonobvious microscope or screening assay can be used for learning about products or processes does not lessen the fact that such "tools" have legal utility. "Many research tools such as gas chromatographs, screening assays, and nucleotide sequencing techniques have clear, specific and unquestionable utility (*e.g.*, they are useful in analyzing compounds)." MPEP § 2107.01 at page 2100-33.

Applicants maintain that use of the claimed nucleic acid molecules to detect the presence or absence of polymorphisms associated with CPS and the gibberellin biosynthesis pathway is no more legally insufficient than using a gas chromatograph to analyze the chemical composition of a gas – such use determines information about the gas, not the gas chromatograph. Even if the gas chromatograph detects the absence of a particular chemical element in the gas, that finding does not obviate the utility of the gas chromatograph itself. Information has been obtained about the gas. Likewise, the claimed nucleic acid molecules have utility even if the absence of a particular polymorphism is detected. Indeed, the absence of a polymorphism usefully demonstrates that the two (or more) populations being compared share a common genetic heritage.

The Examiner also asserts that the claimed nucleic acid molecules lack utility apparently because the "specification provides no association between any useful trait or phenotype and any polymorphism in SEQ ID NO: 7, or that could be identified with SEQ ID NO: 7." Office Action at page 8. Applicants respectfully submit that the skilled artisan would be able to ascertain the use of the claimed nucleic acids to encode CPS or fragments thereof and activities based on Applicants' disclosure, tools available to practitioners in the art, *e.g.,* BLASTX, and the practitioner's extensive knowledge of the gibberellin biosynthesis pathway. Furthermore, such disclosure is not necessary to use the claimed nucleic acid molecules for the disclosed utilities, for example, as probes for CPS, to detect the presence or absence of polymorphisms within CPS, and in CPS cosuppression/antisense applications.

The Examiner has not provided any evidence that would reasonably suggest that the claimed nucleic acids cannot be used for the aforementioned utilities, and therefore has not met the burden of proof required to establish a utility rejection. *See In re Brana*, 51 F.3d 1560, 1567,

34 U.S.P.Q.2d 1436, 1441 (Fed. Cir. 1995). *Accord In re Gaubert*, 524 F.2d 1222, 1225-26, 187 U.S.P.Q. 664, 666 (C.C.P.A. 1975); *In re Langer*, 503 F.2d 1380, 1391, 183 U.S.P.Q. 288, 297 (C.C.P.A. 1974). In fact, the Examiner has provided no evidence challenging the disclosed utilities for the presently claimed nucleic acid molecules. The Examiner "must do more than merely question operability - [she] must set forth factual reasons which would lead one skilled in the art to question the objective truth of the statement of operability." *In re Gaubert*, 524 F.2d 1222, 1225-26, 187 U.S.P.Q. 664, 666 (C.C.P.A. 1975) (emphasis in original); MPEP § 706.03(a)(1) ("Office personnel are reminded that they must treat as true a statement of fact made by an applicant in relation to an asserted utility, unless countervailing evidence can be provided..."). In the Office Action, the Examiner provides no evidence challenging the disclosed utilities for the presently claimed nucleic acid molecules. *Cf. In re Fisher*, 421 F.3d 1365 (Fed. Cir. 2005).

The Examiner further has not assessed the credibility of the presently asserted utilities. Credibility is precisely the issue that the courts have emphasized in evaluating the adequacy of an asserted utility. Utility is determined "by reference to, and a factual analysis of, the disclosure of the application." *In re Ziegler*, 992 F.2d 1197, 1201, 26 U.S.P.Q.2d 1600, 1603 (Fed. Cir. 1993), *quoting Cross v. Iizuka*, 753 F.2d 1040, 1044, 224 U.S.P.Q. 739, 742 (Fed. Cir. 1985). The Examiner "has the initial burden of challenging a presumptively correct assertion of utility in the disclosure." *In re Brana*, 51 F.3d 1560, 1567, 34 U.S.P.Q.2d 1436, 1441 (Fed. Cir. 1995). The utilities asserted in the specification must be accepted as factually sound unless the Patent Office cites information that undermines the credibility of the assertion. *Id.* As previously stated, the Examiner "must do more than merely question operability – [she] must set forth factual reasons which would lead one skilled in the art to question the objective truth of the statement of

operability." *In re Gaubert,* 524 F.2d 1222, 1224-25, 187 U.S.P.Q. 664, 666 (C.C.P.A. 1975) (emphasis in original); MPEP § 706.03(a)(1) ("Office personal are reminded that they must treat as true a statement of fact made by an applicant in relation to an asserted utility, unless counter-vailing evidence can be provided..."). Here, the Examiner has not met this burden.

Applicants have disclosed several specific, substantial and credible utilities for the claimed nucleic acid molecules. Any one of these utilities is enough to satisfy the requirements of 35 U.S.C. § 101. Because Applicants need only establish a single utility to satisfy 35 U.S.C. § 101, and have done so in the present case, the rejection under Section 101 is incorrect. Reconsideration and withdrawal of this rejection are respectfully requested.

III. Claim Rejections – 35 U.S.C. § 112, First Paragraph, Enablement

The Examiner has rejected claims 10, 24, and 25 as not being enabled by the specification, because the claimed invention allegedly lacks utility. Office Action page 13. Applicants respectfully disagree. Applicants assert that the rejection is erroneous and has been overcome by the foregoing arguments regarding utility. Thus, the enablement rejection under 35 U.S.C. § 112, first paragraph is improper. Reconsideration and withdrawal are respectfully requested.

The Examiner additionally alleges that the specification "while being enabling for making the nucleic acid sequence of SEQ ID NO: 7 or it's [sic] complement, does not reasonably provide enablement for making or using the nucleic acids encompassed by the broad scope of claims 10, ..., 24, and 25." Office Action at page 13. Applicants respectfully disagree. Applicants submit that an analysis of the criteria presented by *In re Wands* supports Applicant's position that no undue experimentation would be required to make and use the claimed invention. *See In re Wands*, 858 F.2d 731, 737, 8 U.S.P.Q.2d 1400, 1404 (Fed. Cir. 1998).

The Examiner appears to base the enablement rejection on two basic premises. First, the Examiner asserts that "the art provides evidence of unpredictability as to whether SEQ ID NO: 7 itself or whether the full cDNA (if one exists) that comprises SEQ ID NO: 7 will encode a functional enzyme with copalyl diphosphate synthase activity." Office Action at page 15. The Second, the Examiner asserts that "the citation of sequence similarity results in an unpredictable and therefore unreliable correspondence between the claimed nucleotide and the indicated similar nucleotides of known function and therefore lacks support regarding enablement." *Id.* at page 17. Applicants respectfully disagree for at least the following reasons.

Applicants respectfully point out that the claims are directed to nucleic acid molecules, not enzymes as alleged by the Examiner. Furthermore, Applicants assert that an analysis of the criteria presented by *In re Wands* supports Applicants' position that no undue experimentation would be required to make and use the claimed invention. *See In re Wands*, 858 F.2d 731, 737, 8 U.S.P.Q.2d 1400, 1404 (Fed. Cir. 1998).

Applicants have provided considerable direction and guidance, and have presented working examples such that it is well within the level of ordinary skill in the art to practice the claimed invention without undue experimentation. For example, the specification discusses nucleic acid molecules isolated from various soybean and maize tissues at various developmental stages, as well as homologous sequences. *See, e.g., Specification*, page 42, line 20 through page 43, line 4 and page 144, line 18 through page 208, line 6. The specification also discusses that the nucleic acid molecules can encode gibberellin pathway enzyme, such as copalyl diphosphate synthase, or fragments thereof. *See, e.g., Specification*, page 45, line 3 through page 46, line 14. Moreover, the specification provides sequence homology statistics with regard to the disclosed

sequences and further discloses the functions of various gibberellin pathway enzymes, including copalyl diphosphate synthase. *See Specification*, page 208, line 19 through page 214, line 23 (including Table A). The specification further provides methods for modifying endogenous CPS expression using the disclosed sequences in cosuppression and antisense suppression constructs. *See Specification* at page 103, line 7 through page 105, line 22. Taken in combination, such disclosure provides adequate direction to those skilled in the art of how to make and use the claimed invention as currently claimed.

In addition, as suggested in the references cited by the Examiner, the skilled artisan is well-aware of CPS and related enzymes and methods for determining CPS activity. For example, Smith, *et al.* provides a summary of some of the knowledge the skilled artisan possessed of CPS genes and their enzymatic roles in plant cells. *See,* Smith, M.., *et al.*, *Plant Physiol.* (1998) 118:1411-1419. Smith, *et al.* reviews studies investigating CPS enzymes and assays for identifying or confirming CPS enzymes, for example by full-scan GC-MS of CPS activity products. It is well established patent jurisprudence that Applicant needs not teach "conventional and well-known genetic engineering techniques." *Ajinomoto Co. v. Archer-Daniels-Midland Co.*, 228 F.3d 1338, 1345, 56 U.S.P.Q.2d 1332, 1337 (Fed. Cir. 2000) The teachings of the present specification taken in combination with the knowledge of those skilled in the art, the specification provides adequate guidance regarding the analysis of CPS enzymes.

The first *Wands* criterion is the quantity of experimentation necessary. Applicants maintain that the "make-and-test" quantum of experimentation is reduced by the extensive knowledge, *e.g.*, of conservative nucleotide substitutions, identification of an active site, and conserved regulatory elements, to which a person of ordinary skill in the art has access. The Examiner

generally asserts that undue experimentation would be required by the skilled artisan to use the instant invention. Office Action at page 15. However, one skilled in the art is sufficiently guided by Applicants' disclosure, which sets forth, *inter alia*, nucleic acid molecules and methods of use thereof in the production of transformed cells and plants. *See, e.g.,* specification at page 36, line 8 through page 46, line 14, page 84, line 21 through page 105, line 22, page 210, Table A, and the Sequence Listing. Further, performing routine and well-known steps, such as vector construction, transformations and gene expression analysis, cannot create undue experimentation even if it is laborious. *See In re Angstadt*, 537 F.2d 498, 504, 190 USPQ 214, 218-219 (C.C.P.A. 1976).

The second and third *Wands* criteria relate to the amount of direction or guidance given, and the presence or absence of working examples. Again, the specification provides evidence of sequence identity and hybridization conditions, discusses the use of the claimed nucleic acid molecules to encode a copalyl diphosphate synthase or fragment thereof and discusses the use of the claimed nucleic acid sequence to isolate additional sequences within a genome. *See, e.g.,* Specification at pages 41, line 6 through page 42, line 2, Examples 1-4, the sequence listing and Table A. Based on such disclosure, one of ordinary skill in the art would be enabled to make and use the invention commensurate in scope with the claims.

The fourth, fifth, and sixth *Wands* criteria focuses on the nature of the invention, the state of the art, and the relative skill in the art. The specification provides a detailed description of the nucleic acid sequences required by the claims, and further describes the preparation of constructs and methods of use related thereto. *See, e.g.*, specification at page 84, line 21 through page 103, line 11, page 107, line 4 through page 119, line 16 and Table A (describing nucleic acid mole-

cules of the present invention as encoding a copalyl diphosphate synthase), and page 93, line 15 through page 103, line 11 (describing use of the claimed nucleic acid molecules in methods of transforming plants). Practitioners in this art are guided by considerable knowledge and resources on the conditions and approaches that can be utilized to identify, confirm, and introduce into other hosts, nucleic acid and amino acid sequences.

The seventh criterion considers the predictability of the art. Appellant respectfully asserts, as discussed *supra*, that the specification discloses sufficient guidance to render the results of transformations with the claimed nucleic acid molecules predictable. *See, e.g.,* specification at page 84, line 21 through page 103, line 11. Furthermore, the specification provides sufficient guidance to one of skill in the art to decipher the information necessary to make and use the claimed nucleic acid molecules. *See, e.g.,* specification at page 2, line 9 through page 5, line 18 (describing nucleic acid molecules and enzymes involved in the gibberellin biosynthetic pathway), page 103, line 7 through page 105, line 22 (describing methods for cosuppression and antisense suppression of endogenous enzymes); and page 73, line 12 through page 80, line 7 (citing methods for assaying gene expression).

The Office cites to several references that allegedly "provides evidence of unpredictability as to whether SEQ ID NO: 7 itself or whether the full cDNA (if one exists) that comprises SEQ ID NO: 7 will encode a functional enzyme with copalyl diphosphate synthase activity." Office Action at page 15. The Office relies on a post-filing date reference to argue that "a number of CPS-like sequences were found [in rice] including one which turned out to be a non functional pseudogene... that other homologues might have different functions," and "the frequent presence of small pieces of CPS-like sequences in the rice genome," contribute to the unpredictability.

Office Action at page 16. Applicants submit that based on the disclosure in the specification, the skilled artisan would be able to make and use the invention as currently claimed.

The eighth criterion focuses on the breadth of the claims. Enablement is satisfied when the disclosure "adequately guide[s] the art worker to determine, without undue experimentation, which species among all those encompassed by the claimed genus possess the disclosed utility". *See In re Vaeck,* 947 F.2d 488, 496, 20 U.S.P.Q.2d 1438, 1445 (Fed. Cir. 1991). In the present case, one of skill in the art is specifically guided by the disclosure to look to, *e.g.*, sequence identity data in making that determination.

The Examiner has not met the evidentiary burden to impose an enablement rejection. A specification that discloses how to use a claimed invention "must be taken as in compliance with the enabling requirement of the first paragraph of § 112 unless there is reason to doubt the objective truth of the statements contained therein." *In re Brana*, 51 F.3d 1560, 1566, 34 U.S.P.Q.2d 1436, 1441 (Fed. Cir. 1995), *quoting In re Marzocchi*, 439 F.2d 220, 223, 169 U.S.P.Q. 367, 369 (C.C.P.A. 1971) (emphasis in original).

The above analysis illustrates that the specification clearly enables at least the methods of making and using the invention as set forth in the Examples, and the claims, the enablement requirement has been satisfied. *Cf. Johns Hopkins University v. CellPro*, 152 F.3d 1342, 1361, 47 U.S.P.Q.2d 1705, 1719 (Fed. Cir. 1998) ("the enablement requirement is met if the description enables any mode of making and using the invention") (emphasis added), *quoting Engel Indus. v. Lockformer Co.*, 946 F.2d 1528, 1533, 20 U.S.P.Q.2d 1300, 1304 (Fed. Cir. 1991). Therefore, because the above analysis illustrates that the specification clearly enables at least the methods of making and using the invention as set forth in the Examples, and the claims,

the enablement requirement has been satisfied. *Cf. Johns Hopkins University v. CellPro*, 152 F.3d 1342, 1361, 47 U.S.P.Q.2d 1705, 1719 (Fed. Cir. 1998) ("the enablement requirement is met if the description enables any mode of making and using the invention") (emphasis added), *quoting Engel Indus. v. Lockformer Co.*, 946 F.2d 1528, 1533, 20 U.S.P.Q.2d 1300, 1304 (Fed. Cir. 1991). Accordingly, Applicants respectfully request reconsideration and withdrawal of the enablement rejection under 35 U.S.C. § 112, first paragraph.

IV. Claim Rejections – 35 U.S.C. § 112, First Paragraph, Written Description

The Examiner has reinstated the rejection of claims 10 and 24-25 under 35 U.S.C. § 112, first paragraph, for allegedly lacking an adequate written description. Office Action at page 22. Applicants respectfully disagree.

The Examiner, acknowledging that the specification discloses "the sequence of SEQ ID NO: 7," does not dispute that Applicants had possession of and have adequately described SEQ ID NO: 7. Office Action at page 22. However, the Examiner argues that the specification provides "no evidence that SEQ ID NO: 7 encodes a copalyl diphosphate synthase," and therefore is not sufficiently described in the specification. *Id.* The Examiner goes on to argue that the "teachings of the art and a sequence alignment for SEQ ID NO: 7 provide strong evidence that SEQ ID NO: 7 does not encode a peptide with copalyl diphosphate synthase activity.

Applicants reiterate that the purpose of the written description requirement is to ensure that the inventors had possession of the *claimed* subject matter, *i.e.*, to ensure that the inventors actually invented what is claimed. *Gentry Gallery Inc. v. Berkline Corp.*, 134 F.3d 1473, 1479, 45 U.S.P.Q.2d 1498, 1503 (Fed. Cir. 1998); *Lockwood v. American Airlines*, 107 F.3d 1565, 1572, 41 U.S.P.Q.2d 1961, 1966 (Fed. Cir. 1997); *In re Alton*, 76 F.3d 1168, 1172, 37

U.S.P.Q.2d 1578, 1581 (Fed. Cir. 1996). If a person of ordinary skill in the art would, after reading the specification, understand that the inventors had possession of the claimed invention, even if not every nuance, then the written description has been met. *In re Alton*, 76 F.3d at 1175, 37 U.S.P.Q.2d at 1584. A person of ordinary skill in the art would, after reading the present specification, understand that Applicants had possession of SEQ ID NO: 7, complements and variations thereof. Applicants have indeed demonstrated possession of the claimed invention.

For example, the specification describes the nucleic acid sequence recited by the claims, *i.e.*, SEQ ID NO: 7, as well as, for example, vectors comprising the nucleic acid sequence (*see, e.g.,* specification at page 84, line 21 through page 93, line 14), hybridization conditions which may be used with the nucleic acid molecules of the present invention (*see, e.g.,* specification at page 38, line 13 through page 40, line 4), and other systems that may be used to introduce the claimed nucleic acid molecules into a host cell (*see, e.g.,* specification at page 107, line 4 through page 139, line 2). The fact that the claims at issue are intended to cover molecules that include the recited sequence joined with additional sequences does not mean that Applicants were any less in possession of the claimed nucleic acid molecules.

Applicants have provided in the present disclosure not only the nucleotide sequence required by the claims (i.e. SEQ ID NO: 7), but also several variations including and directed to the claimed nucleic acid molecules. For example, the specification describes appropriate hybridization conditions (*see, e.g.,* specification at 38, line 13 through page 40, line 4); nucleic acid molecules comprising nucleic acid sequences having sequence identity with SEQ ID NO: 7 (*see, e.g.,* specification at page 40, lines 5-19).

Thus, Applicants respectfully disagree with the Examiner's contention that despite the numerous variations of the claimed nucleic acid molecules described in the present specification, "with the exception of sequences consisting of SEQ ID NO: 7 [and] its complement, the skilled artisan cannot envision the detailed chemical structure of the encompassed polynucleotides and proteins with copalyl diphosphate synthase activity they encode". Office Action at page 25. The Examiner appears to assert that each nucleic acid molecule within a claimed genus must be described by its complete structure and function. This assertion is unfounded. The test, promulgated by the Federal Circuit, stipulates that where a genus of nucleic acids may be described by a structural feature that distinguishes members of the claimed genus from non-members of the claimed genus, written description is satisfied. *See Regents of the University of California v. Eli Lilly and Co.*, 119 F.3d 1559, 1568-69, 43 U.S.P.Q.2d 1398, 1406 (Fed. Cir. 1997). In the present case, Applicants have satisfied that test for written description by providing a structural feature, namely nucleic acid molecules that distinguish members of the claimed genus from non-members.

Applicants maintain that they have provided a representative number of detailed chemical structures, i.e., the nucleic acid sequence of SEQ ID NO: 7, and its complement, as well as recited variations. The common structural feature (the nucleotide sequence of SEQ ID NO: 7 and its complement) is shared by every nucleic acid molecule in the claimed genus, and this feature distinguishes members of the claimed genus from non-members. For example, if a nucleic acid molecule such as an mRNA contains the nucleotide sequence of SEQ ID NO: 7, then it is a member of the claimed genus of nucleic acid molecules comprising a nucleic acid

sequence of SEQ ID NO: 7.[2] If a nucleic acid molecule does not contain SEQ ID NO: 7, then it is not a member of that claimed genus. The presence of other nucleotides at either end of the recited sequence will not interfere with the recognition of a claimed nucleic acid molecule as such – it either contains the nucleotides of SEQ ID NO: 7 or it does not. Accordingly, the standard elucidated in *Lilly* for the written description requirement has been met.

The fundamental factual inquiry for satisfying the written description requirement is whether the specification conveys with reasonable clarity to those skilled in the art that, as of the filing date sought, that applicants were in possession of the invention as now claimed. See, *e.g.*, *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1563-64, 19 U.S.P.Q.2d 1111, 1117 (Fed. Cir. 1991). An applicant shows possession of the claimed invention by describing the claimed invention with all of its limitations. *Lockwood v. American Airlines, Inc.*, 107 F.3d 1565, 1572, 41 U.S.P.Q.2d 1961, 1966 (Fed. Cir. 1997), M.P.E.P. § 2163.02. Moreover, the Examiner has failed to provide reasons why a person skilled in the art at the time the application was filed would not have recognized that Applicants were in possession of the invention as claimed in view of the disclosure of the application as filed. "A general allegation of 'unpredictability in the art' is not a sufficient reason to support a rejection for lack of adequate written description." MPEP § 2163 at 2100-170.

The Examiner argues that the specification provides "no evidence that SEQ ID NO: 7 encodes a copalyl diphosphate synthase" and that the "teachings of the art and a sequence

[2] The same argument applies with equal force to every genus of the claimed nucleic acid molecules. For example, if a nucleic acid molecule such as an mRNA comprises a nucleotide sequence 98% identical to the nucleotide sequence of SEQ ID NO: 7, then it is a member of the claimed genus of nucleic acid molecules comprising a nucleic acid sequence that shares between 100% and 98% sequence identity with of SEQ ID NO: 7. *See, e.g.*, claim 24.

alignment for SEQ ID NO: 7 provide strong evidence that SEQ ID NO: 7 does not encode a peptide with copalyl diphosphate synthase activity." Office Action at pages 22-23. Applicants point our that the claims are directed to isolated nucleic acid molecules comprising the nucleic acid sequence of SEQ ID NO: 7 or its complement or comprising a nucleic acid sequence that shares between 100% and 98% sequence identity with SEQ ID NO: 7. As set forth above, the specification describes the invention as claimed. The Office has provided no support for requiring that the specification describe that SEQ ID NO: 7 encodes CPS or a fragment thereof to satisfy the written description requirement. Assuming, *arguendo*, that such evidence is necessary, as discussed above, the specification provides ample support for the assertion that SEQ ID NO: 7 encodes a copalyl diphosphate synthase, or a fragment thereof. Moreover, the cited references do not support the assertion that SEQ ID NO: 7 would not be expected to encode a CPS or a fragment thereof. Office Action at page 23. Rather, Applicants respectfully submit that the references cited by the Office support that SEQ ID NO: 7 encodes a CPS or fragment thereof. The references state that plants are known to have more than one CPS gene. *See, e.g.*, Smith, *et al.* at page 1411. Given the high level of sequence identity between SEQ ID NO: 7 and a known CPS gene and the recognition that plant species can contain more than one CPS gene, the skilled artisan would recognize that the Applicants were in possession of the claimed invention.

For these same reasons, the Examiner's rejection of claims 10, 24, and 25 for lack of adequate written description, *see* Office Action at pages 22-25, must also fail as it too overreaches the requirements of the law. Simply put, Applicants have described the invention encompassed by the claims. No more is required. Based on the foregoing, Applicants respectfully submit that the currently pending claims are supported by an adequate written description pursu-

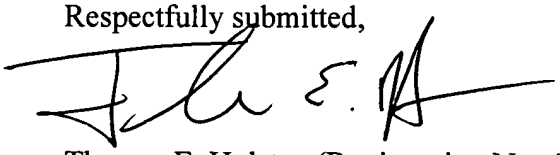
ant to the requirements of 35 U.S.C. § 112. As such, reconsideration and withdrawal of the outstanding written description rejection are respectfully requested.

CONCLUSION

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is now in condition for allowance, and notice of such is respectfully requested.

The Examiner is encouraged to contact the undersigned should any additional information be necessary for allowance.

Respectfully submitted,



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